

# DEFINITIONS

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Guys are always saying that bike needs a "Top End Job" or a "Tune-Up", but what exactly does a good Tune-Up, rebuild, etc. consist of ? Motorcycle engines are a bit different from other engines. If you have a car engine, you can get a rebuilt engine from a lot of different places. You can get a "Short Block" without a rebuilt cylinder head or a "Long Block" with a cylinder head. You can do the same with any of the lawnmower type, small engines. But when you get to motorcycle engines, none of these options are available. This is because they just don't make that many of each type of motorcycle engine. They will make millions of each type of car engine, but only, maybe 100,000 of each type of bike engine. I guess that is the price of performance.

Because of this you must rebuild each engine by ordering individual parts. Oops, I forgot Harley is now offering rebuilt engines for a price, and a place called PMC has just started to offer selected rebuilt engines. Still, on most engines, you just don't have a short or long block available.

Here is what I think is right for a rebuild and why.

On four cylinder bikes, a top end job just isn't economically feasible unless it's a very new bike, you are hopping it up, or it is a restoration. If it's just a bike to get to work on, junk it out and buy another bike.

A four stroke engine top end rebuild would consist of the following:

- New oversize pistons, rings, wrist pin, and clips
- Bore cylinders
- New Top End gasket set
- New Valves both intake and exhaust
- New valve seals
- Check valve guides
- Measure and/or test valve springs
- Cut valve seats

- Clean engine parts
- New cam chain- A lot of people forget this one. If the chain is stretched it will effect the engine timing.
- New cam chain sprockets if possible.
- Check Cam chain Guides and adjuster
- Take a close look at everything as you take it apart. Especially bearings, like on the cam. If things look worn they probably are.
- If you just take the head off, say to fix an oil leak. You better be careful and not disturb the cylinders or you will have an oil leak there too. Gaskets get hard over time and once you break them loose from the metal, they will not reseal well.
- If water cooled, always use anti-freeze and not straight water. If you use water and forget to change to anti-freeze, come winter, the water will freeze cracking the cylinder and/or block.

A single cylinder, two stroke, engine top end rebuild consists of:

- New oversize piston, rings, wrist pin, wrist pin bearing, and clips
- Bore cylinder
- New top gasket set
- If you have a power valve, you may have to grind it a bit to clear the new piston and rings.
- If you have water cooling, always use anti-freeze and never straight water. If you use water and forget to change to anti-freeze, come winter, the water will freeze cracking the cylinder and/or block.

A four stroke bottom end job just isn't economically feasible except perhaps on a single cylinder. On most Four cylinder bikes you would be talking a lot more than the bike is worth. With the exception being Harley Davidsons and perhaps other big bikes that hold their value (Ducati, BMW, Moto-Guzzi etc.).

- If you do go into the bottom end check everything. Like gears, shifter forks, bearings, etc. Now is the time to fix it, while you are in there.
- Replace rod bearing and maybe the whole rod
- Replace the primary chain if it is at all worn
- Replace primary and cam sprockets if worn
- Replace all seals, o-rings, and circlips
- Replace the crank main bearings
- New bottom end gasket set

A two stroke bottom end job consists of:

- New rod, crank pin, crank bearing, crank washers (2)
- New crank seals (2)
- New crank main bearings (2)
- Complete gasket set
- Labor to press the crank apart and together and to true it.
- New crank and clutch lock washers and it's a good idea to replace all the other seals, (kick starter, counter shaft, shifter, etc.) o-rings, and circlips.

A multi-cylinder, two stroke, bottom end job isn't economically feasible unless this is a classic restoration and you have lots of money. If it's just a bike to get to work on, junk it out and buy another one.

- If you do go into it replace all seals, o-rings, circlips, and gaskets.
- Replace all main bearings

A good tune-up is simply resetting all the things on a bike that wear and change, back to the original factory settings. You will find that a simple tune-up will cure a lot of problems. ALWAYS do a full tune-up BEFORE you start ripping things apart.

A four stroke, electronic ignition, bike tune-up consists of:

- Adjust valves.
- Some bikes have hydraulic valve adjusters and don't need regular adjusting.
- Lube all cables
- Lube any grease fittings you can find with a grease gun
- Clean or replace the air cleaner
- Adjust front brake cable
- Adjust rear brake cable or shaft
- Adjust rear brake light switch.
- Adjust and lube chain
- Install new spark plugs and properly adjust the gap
- Check spark plug caps
- Lube all pivot points on the bike (side stand, levers, etc.)
- Change oil and filter.
- On some bikes check the transmission oil
- On some bikes check the drive line and rear end oil
- Check the brake fluid on hydraulic brakes and clutch
- Check tires for damage, tread depth

- Check tire pressure
- Check spokes for tightness
- Check all light bulbs
- Run a compression check on all cylinders and keep a record of it.

for a points ignition bike add:

- Adjust or renew points and retune engine

For a two stroke lose the valve adjustment and add:

- Adjust oil pump

You will notice we don't just replace everything without a good reason. On a car rebuild you replace a lot of stuff because new doesn't cost much. Like valve springs. A set for a car may be 10-20 dollars. on a bike they are 5 bucks each... 2 for each valve... 8 for each cylinder... 32 for the engine. 5 times 32 is an extra \$160. A lot of money, at least to me ! So we measure them and reuse them if we can. So it is with everything else.

One last thing to consider. On all jobs there are only two ways to go.

- Do it right and replace EVERYTHING that needs replacing.

OR

- Do ABSOLUTLY as little as possible. Only replace the things you must replace.

Reuse everything else. Save every penny.

Don't do things half way. You will be wasting your money. All or as little as possible. Cheap it out or bit the bullet. Those are the choices.

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